GARDEN AND FOREST.

PUBLISHED WEEKLY BY

THE GARDEN AND FOREST PUBLISHING CO.

Office: Tribune Building, New York.

Conducted by . . . . . Professor C. S. Sargent.

ENTERED AS SECOND-CLASS MATTER AT THE POST OFFICE AT NEW YORK, N. Y.

NEW YORK, WEDNESDAY, OCTOBER 12, 1892.

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Gardening a Human Bond.

IF there is one pursuit that forms a link between human beings of different stations and habits, gardening is certainly that occupation, for whether it be the vocation or the avocation of man or woman, it appeals to so fundamental a taste that it makes a common ground upon which all can meet with interest and sympathy. It is the primal occupation of man; the final result and joy of his highest civilization. From the clod we come, to the clod we return, actually and figuratively, our fashioning from the dust of the earth pointing plainly to the fact that man was a graminivorous creation, deriving his sustenance from the grains he rescued from the tropic sands where he originated. It is a theory of the historical philosophers that man first developed into civilization in some rainless and unchanging region like Egypt, or the western slope of the Andes, and that there, under unvarying conditions of climate, he first established communities, and tilled the soil—hence, possibly, this old idea of his evolution from the dust of the earth.

As the animal with forethought to plant and dig was an advance upon his predecessors, so the agriculturist is a higher development than the nomad who goes in pursuit of his crops instead of waiting for them to come to him; and it is a curious fact that after man has circled the globe in pursuit of wealth or amusement, he comes back to the culture of his own acres as the most dignified and satisfactory ending of his career, the only one which is not an anti-climax. Contented and not inglorious, Cincinnatus returns to his plow, Washington to Mount Vernon, Jefferson to Monticello, and Mr. Gladstone to Harwarden. The spectacle of Mr. Pitt, happy in a three-years release from political life, and enthusiastic in the culture of his garden, is one unfamiliar to the world, which scarcely disconnects him from the great area in which he was the central figure, but is gratifying as an evidence of the humanness of that great statesman, and of that solid wisdom of which he gave perpetual proof in his public career.

Poets and philosophers alike have rejoiced in rural shades, in the charm of pleasant labor among their flowers and trees. Gardening is the delight of royalty and the comfort of the cottager. The greatest ladies in England have taken pride in designing their own parterres, while the game-keeper's daughter rejoices in her little square of flowers. It is an occupation for the very rich, a solace for the very poor. It can occupy acres of territory, it can be carried on within the limits of a grocery-box. It is the priceless heritage of man, this right to till the soil, this joy in its accomplishment. Whether the results be utilitarian or æsthetic, the satisfaction is common to all, there is no monopoly of this privilege. In this great half-occupied country of ours, it is easily possible for a man to possess a morsel of territory for his own cabbage or marigold. There comes a period in the lives of most when this primal desire demands accomplishment. Then upon his fragment of the earth's surface a man sits down, and content begins. Not idle content, certainly, since only by the sweat of his brow can man overcome nature, but that discounted content which is the human substitute for happiness.

Results may disappoint in detail, but the aggregate produces a certain mental well-being which peer and peasant alike share. The triumph of the harvest is for all, and though there may be years when harvests fail, they are the exception. There may be a harvest of the spirit, even if the crops fall short, a gain in health and knowledge from the hours of labor that are a balancing gain for disappointment. It is not only material results we gather in, but the harvest of experience, the gain of wisdom, the science for the coming years, and in these human benefits there are no hampering trusts. The planter may sell his crops a year or two ahead, and find himself short of the market, but there is no corner in experience which confines it to a chosen few, and of this gain the gardener, be he high or low, may be sure, so that his labor can never be a dead loss.

Moreover, he who loves his garden is in touch with his kind, whether he find himself in Columbia or Cathay, for on this topic all may meet, the Russian mujik and the Czar, the Egyptian fellah and the Bey, the American traveler and the Daimio of Japan. There are gardens from Babylon to the Golden Gate which have delighted the heart of man from Eden until this day. To be cast out from a garden was the curse of Adam, and the struggle of fallen man ever since has been to repair that primal disaster. A hankering for an Eden is at the bottom of our wandering souls, and we are ever striving to fashion it to our conception of the lost Paradise. The idea is common to all—the expression varies in each individual. If originality inspires the owner, the garden will be original; if the conventionalities be dear to him, you will find formality in the arrangement of his flower-beds; the artist will interweave it with his taste and fancy; the poet will seek in it to embody his dream; the practical man will turn it into a Potato-field; the speculator will plant it with Wheat; a sentimentalist will fill it with Roses and Lilies; an æsthetic, with Sunflowers. And from whatever clime you come you will read the man in his garden, nor need an interpreter to explain him to you.

There is no region where man's effort to reclaim the soil does not possess an interest for all other men. No tale of the march of conquering hordes captivates like the story of the founding of a state, and the state's foundations are laid by its plowshares. In Egypt the great river has been harnessed for the service of man; in Holland he has fought the sea to win a foothold for his sturdy independence, a garden for his bulbs. With the Romans marched the culture of Europe; in the wake of their great armies sprang up the cereals and the trees of the forest. Cæsar was no less a conqueror of the soil than of opposing armies. He carried in one hand the sword, in the other the life-giving grain. To him, first of all, Britain owes the planting of her

barren acres with fruit-trees, with the Lime, the Chestnut and the Plane; possibly with the Elm itself, though Dr. Walker thinks that noble tree may have been brought there by a Crusader. And strange fact in the history of man, his triumph is the triumph also of the garden—its seeds and nuts, its grains and flowers springing up in the footsteps of Alexander and Xerxes, of Crusader and Spanish Don, to flourish and comfort long after the mailed hand that brought them was dust.

Thus in the path of the oppressor came a blessing, "out of the strong came forth sweetness." Here again that human touch links us with the old warrior of the past, bringing home from Damascus a Rose-slip to gladden the garden of his sweetheart, a sprig of vine to commemorate the hills of Palestine on the borders of some English lake. It is pleasant to think how the memory of his own garden made the Macedonian bring home to Greece the flowers that his master wrested from Darius. The Rose from Persia, the Lily of the farther East, are a bond of common interest between the old world and the new; between the mailed Past and prosperous Present. The Lotus of the Pharaohs is the glory of a Jersey mill-pond, the Pæony of the Hoang Ho is the ornament of a dooryard by the Charles, our very weeds bind us together to fight a common enemy, and thus the love and care of a garden brings man into fellowship with all the sons of Adam.

It was recently argued in these columns that it would be desirable for women of artistic taste to learn how to employ it in the proper planning and embellishment of the grounds of their homes, as well as the interiors of their dwellings. If women develop capacity in this direction there should be opportunity for their employment in a professional way. Some prejudices as to what constitutes a proper occupation for women would need first to be removed. We have in mind the case of a young woman whose father was superintendent of the park system, in a flourishing New England city, and who developed such a taste and capacity for the work that she became his most capable assistant. The eminent landscape-architect who had designed the parks of the place recommended, on the death of the superintendent, that his daughter be made his successor. She knew the duties of the position thoroughly and appeared altogether the most fit and competent person available for the position. The park commissioners promised to appoint her but failed to keep their word, giving as a reason that, while they really desired to do so, the local politicians would never sanction the appointment of a woman to an important position like that. Architecture is becoming a pursuit for women, and our leading architectural journal welcomes them to the profession, saying that their knowledge of household requirements makes them peculiarly valuable in the planning and designing of dwellings. There is no reason why women should not enter callings that bring them into the healthy life of the open air, if no hard manual labor is demanded. Therefore landscape-gardening is a suitable employment for those who are capable in this direction. Women are now giving themselves to horticulture and floriculture to a considerable extent; in the latter, particularly, their almost universal love of flowers gives them a peculiar fitness for such work. Schools for the training of girls in these employments would be admirable institutions.

In this connection a novel occupation for women, that has just been brought to our attention, is worthy of mention. The park commissioners of Lynn have recently established a carriage service in their noble great pleasure-ground, the Lynn Woods. At present but one carriage is run, and it is driven by the wife of the man to whom the contract was given, she being fond of open-air life. The fact is highly appreciated by the women who, with their children, form the great majority of the patrons, for their driver has a very pleasant and friendly way of pointing out the interesting features of the beautiful route. Why should not a woman, who understands thoroughly how to handle horses, make an occupation of taking women and children on drives through interesting and pleasant places?

All persons who are interested in the preservation of our forests will be pleased to see any efforts to secure economical methods in the manufacture of lumber. Of course, there is a large amount of material which goes to waste, in the shape of slabs, edgings, etc. From twelve and a half to twenty-five and a half per cent. of every log is turned into sawdust, and in addition to the other waste not more than fifty or seventy-five per cent. of any log is used. A great many mills make laths and pickets and the like from slabs, but, after all, the amount of waste which is burned is enormous. In an article entitled the "Waste from Pine Forests," the *Northwestern Lumberman* comments on the large amount of good material that is wasted in such an instructive way that we give in a condensed form a portion of the article:

The examination of any slab pile will show that much of it can be converted into small articles of common use, which only require lumber which is too short to be used for lath, pickets or similar stock. Staves for pails and tubs, material for cutlery trays, a vast variety of small boxes, material for toys in endless variety, handles of domestic utensils, window-sash, blinds and screens, besides bridging and small stuff in house-building, can all be manufactured out of these waste products. Perhaps it is safe to say that all these articles, which are used within the limits of the north-west Pine states, could be made from the waste of the saw-mills which at present is destroyed at great expense, and is only a source of annoyance. This is especially true also of the Yellow Pine districts in the Pacific states. Only a small proportion of the articles named are manufactured in Washington, Oregon and California, that is, while these states are spending money to get rid of the waste of their saw-mills they are importing articles which could be made from this same waste. In any given quantity of logs in California, hardly forty per cent. of their cubical contents ever reaches the market in the shape of merchantable lumber, as can be seen by any one who examines the saw-mills among the red-wood or pine of the Cascade range or the Sierra Nevada foot-hills. The wastage in the Yellow Pine country runs from thirty-seven and a half per cent. to fifty per cent. of the cubical contents of the log, or, in other words, on an average not over fifty-eight per cent. of the log reaches the market. In England and Continental Europe and in the older states of the east almost every saw-mill has in connection with it some shop for working the refuse from the mill proper into merchantable articles, and in many cases the saw-mill is an adjunct of the other department instead of the reverse, so that the loss of the material of the log is reduced to a minimum in Europe. This working up of forest-products does not stop with the saw-mill waste, but takes up the waste in the forest itself during the process of logging.

In Massachusetts, Vermont and Connecticut, the great number of little mills have no necessity for a fire-pit, and the choicest pieces of waste can be carried away in a basket. Nowhere in Europe, except in the Scandinavian peninsula and in the Baltic provinces, is timber cut primarily for the sake of what is ordinarily called lumber. In most countries there are government regulations to prevent the loss of forest-material by manufacturers. Such an interference would be resented in this country, but it must come in time. If a man with a million dollars in paper currency should be found burning it up, the state would interfere to prevent his insane waste in the interest of his heirs and in order to prevent him from becoming a public charge, and the time is rapidly coming when the question of saving the waste of forest-products, together with saving the energy lost in the combustion of costly fuels, will demand the attention of the best brains of the country, if not governmental interference.

Certainly these are the most brilliant days in the year, especially when ushered in by a frosty morning which bears the same relation to a merely dry or foggy one at this season that a dewy morning bears to a parched and languid one in summer. The year seems ripened like a fruit by frost, and puts on the splendid tints of maturity but not yet the color of decay. It is not sere and withered as in November.— *Thoreau's Journal*, Oct. 10th, 1857.

A Florida Live Oak.

A SHORT distance to the westward of the Ponce de Leon Hotel, at St. Augustine, grows a Live Oak (Quercus Virginiana), which even the most impassive guest notices and admires as he drives by. The extremities of its lateral limbs, after the manner of the Live Oak when growing alone, almost sweep the earth's surface, and its branches form a singularly perfect hemisphere, as may be seen in the illustrations on pages 486 and 487, made from photographs taken in early March of the current year. A measuring line of fifty feet, drawn from the middle point of the first fork and through this hemisphere, will reach its exterior limits with remarkable uniformity at the tips of all the great limbs. The tree is on the ground of Mrs. Hanna, and the neighbors make the improbable statement that it was planted about a hundred years ago. Eighteen inches above the ground it is fourteen feet one inch in circumference, and the principal limb has a girth of six feet. This tree is doubtless the largest in its vicinity, but in the rich bottom-land of the St. John, near Jacksonville, I have seen specimens of the same species which I believe to be larger, and I have had described to me one on the Ashley River, near Drayton Manor, with a spread of branches one hundred and twenty-eight feet in diameter.

Enormous must be the torsional strains thrown upon the sturdy trunk of the St. Augustine Oak when the winds that sweep up from the sea twist and wrench the great whorl of tough limbs that seem a wheel of levers formed to tear the tree from its hold upon the earth. And the hurricanes have left a record of long and labored resistance, in the sinewy form of the bole, where swelling cords of fibre bind together limbs and roots, and the fine modeling of the wood suggests the welted arm of a wrestler whose muscles have been trained and shaped in the life and death struggles of the arena. This grand trunk is coated with a soft gray bark upon which the sunlight, reflected from the shining sand, falls with wonderful effect, illuminating a network of crisp ridges and channels, all finely wrought, incised, fretted and frosted as though cut and chased with the chisel and graver of some inspired artist from a mass of virgin silver ore.

New York. *Robert H. Lamborn.*

Shongum.—III.

A MAN once made himself famous by bringing to notice the Providential nature of the fact that great rivers always ran near large cities. In humble imitation, let me suggest the beneficent intent with which a mountain-range of easy access, and so full of elements of health and pleasure, was placed so near the large centres of population on the Atlantic coast.

It is almost to be regretted, that the state cannot keep the right of eminent domain over these cliffs and lakes and forests, that may in time rival the primeval ones in grandeur. Wise forestry laws, and the planting of trees to produce the best quality of timber in places now denuded, or where the growth is worthless, would greatly increase the resources of the state and furnish employment and homes for many of its now idle citizens. Forests growing on the uplands would fill the diminished water-springs and fertilize the wide valleys of the Wallkill and the Roundout. Fine-grained sandstone, which takes a polish like marble, is found here in unlimited quantities, and is well adapted for all architectural purposes. There is space enough in these vast solitudes for innumerable stately homes with wide lawns and sunny gardens, without encroaching upon the restful and health-giving recesses of the forest. The fine shale which underlies the sandstone and comes to the surface in various places could be used to make, through all the length of the range, roads as good for driving as those which now add so greatly to the attractions of Mohonk. Under the paternal government of Bellamy's dream, the region would support a large population in peace and plenty, and still afford breathing-space for the dwellers of the city in their hours of leisure.

From Millbank Mountain, which is nearly the highest point of the outside wall so abruptly separating this region from the valley, we came by an easy carriage-road to the edge of the cliff. Here we climbed a few steps upward over a glacier-polished dome, and looked down 1,300 feet to the farms below. Standing upon the bastion of the rock that projects a little below the highest ledge, we dropped a stone, and by timing its fall measured the depth of the abrupt descent. Seven hundred feet below it struck the flat top of the foundation-wall, and then bounded into the vale beneath. The strength of fibre in a Yellow Pine growing in this exposed situation compelled admiration. Though it had been from infancy buffeted by the tempest, it had grown strong and straight, fully thirty feet high, with a well-developed crown of foliage. Its fellows were less vigorous, many even bent and broken, and some, like alpine trees, deliberately lay down to grow.

Millbrook and High Point, rising above the other peaks, look at each other evenly across a distance of a few miles. Sewockenomo and Onaghtin, chiefs of the Esopus tribe, must often have looked anxiously from these points over to the Hudson River, where colonies of the Dutch had been established. On May 16, 1664, they signed the treaty by which the whites took peaceable possession of the land. These historic names might well take the place of the common names the peaks now bear. Palmaghatt, which sounds oriental but is probably an Indian relic, is the name of a deep, narrow ravine, opening between two sections of these upright walls and ending in the upper valley beneath one side of High Point. It is two miles long, and in some places not more than thirty feet wide, with an average width of fifty feet. For most of the length these walls are from ninety to two hundred feet high, but as they widen reach a greater elevation. A small brook, fed by springs or by subterranean leakage from the lake, runs through Palmaghatt, but is so covered by broken trees and fallen rocks that though its musical tinklings are often heard three feet beneath the elastic surface, its waters seldom come to light. This deep, damp soil once nourished gigantic Hemlocks, long since felled and stripped of their bark. Their successors, which we trust the woodman of the future will spare, bid fair to equal them. Here the Yellow Birch also grows very large and tall, and to one looking down from above the ravine seems full of leafage like a bit of the primeval forest and must have afforded a safe hiding-place in the Indian wars.

Mossy Glen is a larger basin and similar to that through which the Awasting flows, but wider and more open to the sun. Its bordering walls hint at seismic disturbance, or the level strata seem to have loosened and twisted on their foundations, and at one point the great square rocks have fallen and are heaped together like the ruins of a temple. Here, too, the soil is deep. The smaller growth has been judiciously cut and the larger trees have space for full development. We measured a Black Birch seven feet four inches around, four feet above its roots, and a White Birch eight feet two inches, and there were many trees as large as these. There were many Hemlocks as large as those in Palmaghatt, and though most of the oldest trees had long ago been removed, their decaying stumps told the story of former grandeur. One recently cut lay on the ground entire and stripped of its bark; the butt measured forty-nine inches in diameter. The Birch-trees were unusually tall and straight, lifting their leafy canopies twenty feet above us.

These trees are also interesting from their power of adapting themselves to circumstances. I came upon one which grew with quiet grace beside a rock, but on one side had thrown out a buttress that divided itself into branches four inches in thickness and then run into the ground. On closer inspection I found that the supposed rock was the large root of an older tree decayed past all shape, while the stem lay behind it a mere bank of Mosses. Then I knew what had happened. The young Birch had begun to grow at the root of an older tree. Some other applicant for the same position had crowded it and curved its stem. The old tree fell one day and the Birch found itself with its face to the ground, its deformed back making a curve in the air. In the upheaval the crowding neighbor had disappeared, and the two lower branches that had before drooped near its roots were looking up to the sky. What messages were sent from head to foot, what answers were whispered by the trembling leaves, we shall never know, but these two branches have grown into tall trees of equal height, the parent stem and other branches having willingly buried themselves to sustain the symmetry of the favored pair. If these dumb children of earth could speak, what stories they might tell of fortune and misfortune, of fear and desire. To one who observes closely, there is so much individuality in native growth. It appeals to the imagination as nothing cultivated can do.

At the eastern end of Lake Minnewaska stand a Birch and a Hemlock, their twisted roots giving evidence of some dramatic incident in their early history. The water here is shallow and the border level for a space, and other trees grow straight and commonplace. But these in seedhood, perhaps, perceived some need of mutual help, or else struggled together over some plant-food until their roots became strangely interlocked, looped back and forth and twisted together like the limbs of athletes wrestling. But now Tsuga, without ap-

parent reason, leans out over the lake, and Betula holds him so firmly he cannot fall. I looked and wondered what history was thus told, until I thought I heard the Hamadryads laugh. The sound seemed to come from a distance, but that was, no doubt, a trick of the sly creatures. I have before spoken of the mixed growth of trees here, and the sudden transitions of level within a small area gives place for an equal diversity of flowers. Within four miles around the lake I have noticed seventy varieties of blossoming and fruit-bearing plants. The Asters and Asteroidæ are now in great wealth of bloom, and some varieties of special beauty. Coreopsis and many kinds of Solidago make the rocks and road-sides gay. Beside the Peterkill fall the Chelone contrasts its spikes of rose and purple with the white umbels of Eupatorium. Heliopsis and Helianthus show two variations, and there is a very fine H. tuberosa that I think has strayed from some garden. There are three kinds of Trillium. The Montropa uniflora is unusually large and beautiful in shady places, and I have found also the Medeola Virginica holding its purple berry in its crimson-tinted involucre instead of the white petals that drooped there when I saw it in April in the mountains of North Carolina. There is a rare and beautiful low-growing evergreen, Corema Conradii, to be found in Palmaghatt, and an aromatic Fern new to me, Aspidium fragrans.

The adaptation of soil and climate here to the growth of flowers is proved not only by the abundance of wild bloom, but by the rich beauty of the gardens at Mohonk. It has been said that we think we can improve upon nature by shaving a lawn and making impertinent flower-beds. But the skill with which groups of flowers have been massed in harmonizing or contrasting colors around the pretty pavilions and arranged to give effect to the wide sweep of the lawn, delights the eyes that may be a little weary with the monotony of woodland tints. On the higher levels of these mountains the prevailing growth is of Yellow Pine (Pinus mitis), but the Pitch Pine (P. rigida) is frequent, and here and there is seen a remnant of an older forest, P. strobus, standing high above the younger generation. Sometimes there is only a naked giant, scathed by lightning or killed by more ignoble fires, but often wearing a crown of sombre glory, and as vigorous as in youth. These trees, whose needles do not retain moisture as do the deciduous trees, increase the dryness of the pure sunlit atmosphere and give it the spicy and resinous fragrance so welcome to the invalid.

Minnewaska, N. Y. *M. H. P.*

Oil-making in Italy.

THE Italian autumn gains a fresh picturesqueness from the active groups about the Olive-trees engaged in the harvest of this classic fruit, which is still treated with old-world conservatism, after the antique methods of the forefathers. On the ground are spread great sheets, upon which the fruit is heaped as it is gathered, and busy groups come and go around, even the old gray-foliaged twisted trees, whose tormented attitudes suggest always that they are at variance with the climate, and are fretting after a warmer region sheltered from Mediterranean winds and the cold breath of the tramontana.

The Olive-picking is a delicate business, for it is useless to gather the crop before it is ripe enough, and no less disastrous to delay a day too long, so in the heaps of gathered fruit quite a third of the berries are usually green. Like the high-bush Blackberry of our native land, the fruit turns from green through red to a bluish black. It needs gentle handling, and ought always to be picked by hand. Nor is this a difficult matter, for the trees, if properly cultivated, are well cut back to keep them stocky, while the branches are cleared out from the centre and trimmed across the top, at about fifteen feet from the ground, as smoothly as any hedge-row in England. Once brought to the desired shape and size, they can be so maintained for centuries. The flavor of the fruit is said to improve with the age of the tree. The Olive-trees on the slopes below Tivoli are said to have seen the Emperor Hadrian's sumptuous villa in all its splendor.

The men use ladders and take charge of the upper branches; the women, bare-headed or brightly kerchiefed, stand about and pick all the fruit within reach; children swarm about the ground for the fallen berries. They sing a snatch of some Tuscan stornello, which is taken up and carried on from tree to tree and orchard to orchard; but in the midst of the strain they break off to indulge in a bout of the most unsparing chaff, to dispute some mandate of the overseer, or to pay their respects to the padrone or owner of the property as he passes, mounted on his sure-footed little pony. Over all the sun is shining gloriously, in a sky so blue that the gray Olive-leaves turn white against it, and so still as to seem almost unearthly to one accustomed to the atmospheric unrest of New England.

When their large, flat baskets are full the pickers take them to the granaries to be emptied. The sooner the berry can pass from the tree to the mill the better, says the Tuscan farmer, but though the machines are kept working night and day in the height of the season, they do not suffice if the crop be large, and the superfluous berries are carefully spread in thin layers upon dry floors. There is in the olive a thin watery liquid, the same which makes the fresh fruit at once so nauseating and bitter to the taste, and this, almost as soon as the olive has left the tree, begins to ferment and work its way out of the fruit. It must dry off at once or a mold forms upon the berries, which renders them absolutely worthless.

As soon as may be, therefore, the olives are picked over, cleared of leaves, washed, if necessary, and taken to the press. Since oil-making demands, above all things, an equable temperature during all its processes, the uliviera, as it is called hereabout, is usually installed under ground. Accepting an invitation to enter one of these the other day, we found ourselves, when once our eyes were used to the dim light, in a great branching cavern, hollowed out of the soft rock of the Sienese hill-side. Above was a roughly groined ceiling, on our right the olive-presses proper, before us the machines for crushing the fruit, and beyond a charcoal fire with a huge kettle of boiling water suspended above it. In a dark corner a door led to the inner cave, where the oil is clarified.

There were two crushing machines at work when we entered. The base of each consisted of a huge circular block of the yellow marble of Siena, seven feet in diameter, eighteen inches high upon the outer edge, and sloping inward to a depth of about six inches in the centre. Here was inserted a massive iron pivot, with a short arm attached to a mill-stone of the same beautiful stone as the base, and which was driven round and round in the cavity by one of those sturdy little ponies which are the pet and pride of every Tuscan farmer. Unwearyingly these two closely clipped, mouse-colored, willing beasts kept at their monotonous task, giving a friendly nip at one another as they met on their circling paths or responding to a caressing word by a hasty rub of the head on the shoulder or arm of the driver, but never lagging for an instant on their unending round.

Into the hollow of the lower stone is first thrown a heap of Olives, perhaps two or three pecks, a little boiling water is added and the horse starts off. The water has to be renewed from time to time, and the revolving stone, which has been so set as to detach the pulp as much as may be without breaking the stone of the fruit, not only bruises the berry but slowly forces the whole mass of pulp about the cavity. After some fifty minutes it will have made a complete revolution and it is then ready for the first pressing, which yields the finest oil. After this the pulp goes back to the mill-stones for a further crushing, is then repressed for second-class oil and the refuse of this is sold to the proprietor of a steam-press, who still succeeds in extracting a profitable amount of machine-oil.

Steam in new establishments often replaces horse-power at the crushing-mill, but the press is always worked by hand. It takes intelligence—and experience too—to tell when the screw has received a sufficient number of turns and when the pressure may again be increased. The crushed olives, called at this stage lansa, are confined under the screw-press by means of gabbie, which look, as you see them hanging before the shop-door, like elaborately twisted coils of clothes-line, but which are really bags woven in circular shape, each capable of holding two or three quarts of pulp. A half-dozen of these are slipped over the upright of the iron screw-press, which has long replaced the clumsy wooden lever of early Roman days, and pressure is put on most gently and cautiously for the first quality of oil, but with less precaution for the second grade when the stones have been crushed.

The oil, as it runs from the press to the great earthen jar beneath, appears of a brownish color, owing to the presence of the bitter watery liquid before mentioned. The specific gravity of this and of the oil proper is, however, so different that the work of clarifying begins at once and spontaneously. It is assisted and consummated in the dim inner dungeon, but the secret of this process is never revealed. The great vases of rude pottery are ranged about the walls, each displaying a more advanced stage in the clarification of its contents, till finally a beautiful smooth, translucent, greenish yellow liquid is revealed. But it is not wholly out of politeness, as we know, that the three workmen suspend their labors when we come in, and though their chief makes the round of the little room with the greatest affability and responds with true Italian courtesy to every question, his elaborate answers are distinctly vague.

"Water is used, in a proper quantity, at a proper temperature, which he himself determines; the oil is poured back and forth a proper number of times, when that seems the proper thing to do. The Signorine must find all these details very dry, and he asks their pardon for troubling them." The Signorine know at all events when questions are useless, and with an exchange of compliments take their leave.

When the oil comes out of the magician's black cave, it is ready for the market, but it is usually kept on hand for a time in a store-room, the floor of which slopes toward a central hole, under which a great earthen jar is set. If no breakage occurs, the only further care the oil receives is to be trans-vased as a precaution against fermentation when the great summer heats begin in June; otherwise it simply stands and waits its market. About thirty-five per cent. duty, ad valorem, is paid on it when it enters the city gates, and the shop-keeper doubtless takes his profit, but even so, the finest quality costs the house-keeper twenty-seven or twenty-eight cents a quart, and the finest quality is used, not only for the table and in cooking, where it admirably replaces lard and butter for frying and basting—but even in the tall classic lamps. "Anything but the very best always has an evil odor," the servants say, and they are doubtless right, but it always pains my New England thrift to see the beautiful greenish golden liquid put to so base a use.

Sienna, Italy. *Louise Dodge.*

New or Little-known Plants.

New Orchids.

Pleurothallis subulata, Rolfe.—A species allied to P. cardiothallis, Rchb. f., with cordate-oblong leaves and dark lurid purple flowers, from the collection of Baron Henby, of Peckau, Bohemia. Its native country has not been recorded.—*Kew Bulletin*, p. 137.

Restrepia Ecuadorensis, Rolfe.—An Ecuadorean species allied to R. antennifera, Kunth, but with shorter lateral sepals and other differences, though with a general resemblance in coloration. It was imported by Messrs. F. Sander & Co., of St. Albans, and flowered in their collection.—*Kew Bulletin*, p. 138.

Restrepia Shuttleworthii, Rolfe.—A small brightly colored species, imported by Messrs. Charlesworth, Shuttleworth & Co., of Heaton, Bradford, and flowered both in their collection and at Kew. It is allied to the Guatemalan R. xanthophthalma, Rchb. f., but, besides other differences, the flowers are more heavily marked with crimson-purple blotches.—*Kew Bulletin*, p. 138.

Dendrobium platycaulon, Rolfe.—A very singular species, introduced from the Philippine Islands by Messrs. F. Sander & Co., of St. Albans, with whom it flowered. It is allied to D. lamellatum, Lindl., but the flowers are twice as large and the lip quite different. The pseudo-bulbs are curiously flattened, and bear three to five leaves near the apex, and racemes of three to six straw-colored flowers.—*Kew Bulletin*, p. 139.

Bulbophyllum densiflorum, Rolfe.—A small species allied to B. triste, Rchb. f., but with a long raceme of yellow instead of deep purple flowers. It is a native of the eastern Himalayas, and was sent to Kew for determination by Mr. N. Campany, The Gardens, Thedden Grange, Alton, Hants.—*Kew Bulletin*, p. 139.

Eria cristata, Rolfe.—A pretty little species, allied to E. marginata, Rolfe, and, like all other species of the section Cylindrolobus, having large petaloid bracts. The flowers are white, with some yellow markings on the lip and a hairy crest at the base of the front lobe of the same. It is a native of Moulmein, and was sent to Kew by Mr. C. Peché.—*Kew Bulletin*, p. 139.

Odontoglossum auriculatum, Rolfe.—A pretty little species allied to O. Lindleyanum, Rchb. f., but differing in its hastately-trilobed lip, whose disk is light purple instead of brown. It was imported by Messrs. F. Sander & Co., of St. Albans, together with O. Nœvium, Lindl. The name is given in reference to the ear-like side lobes of the lip.—*Kew Bulletin*, p. 140.

Odontoglossum guttatum, Rolfe.—An interesting species allied to O. odoratum, Lindl., and O. præstans, Rchb. f., with light yellow flowers irregularly blotched with chocolate. It is a native of Ocana, and flowered with G. R. le Doux, Esq., of East Molesey, in March of the present year.—*Kew Bulletin*, p. 140.

Spiranthes olivacea, Rolfe.—A north Peruvian species, with olive-green leaves, marked with a few white spots, and light olive-green flowers tipped with faint pink, and a whitish lip.—*Kew Bulletin*, p. 141.

Kew. *R. A. Rolfe.*

Foreign Correspondence.

London Letter.

Tree-pruning.—I refer to this subject because two American gardeners who lately visited England publicly found fault with what is done in good gardens here to keep young trees shapely. There are, apparently, people who take an interest in hardy trees and shrubs who object to pruning of every kind, holding that all plants should be allowed to grow their own way from the seedling stage to maturity. To prune, they say, is to interfere with nature and to destroy the distinctive character of the tree. With plants growing under natural conditions there can be little need for the cultivator's interference, but the conditions of every garden must be more or less unnatural for the bulk of the plants grown in it, and for them the gardener's art must be exercised. In every badly managed garden one sees crippled, one-sided, rickety, misshapen trees and shrubs which are distressing enough to the man who looks for health, vigor and true form in all the things of the garden. I know that unless young trees in the garden are looked after—that is, made to grow upright, form a backbone and keep in balance—the bulk of them will soon grow otherwise. Many people who are responsible for trees pay no attention whatever to their development, leaving the branches to form and take whatever direction they please, with the result that they often grow into something totally unlike what they are under favored natural conditions. My view is that the man who allows his young trees to grow one-sided, or the lateral branches to develop out of all proportion to the leader because he considers it an outrage on nature to prune, is just as wrong as one who would allow his child to become bow-legged for want of a little support, or round-shouldered for want of gymnastic exercise. Even nature will produce cripples, but we want none of them in the garden. To keep a tree shapely and in proper balance by judicious pruning is one thing; to clip it into a form unlike what it assumes naturally is another. There must be pruning, a good deal of it too, in all well-kept gardens.

Pruning Coniferæ.—In many gardens coniferous trees become thin and scraggy owing to the excessive and uneven growth of the lateral branches. This, we find, can be rectified by pruning, the long, thin branches being shortened, in early spring preferably. It is surprising how soon the trees right themselves under this treatment, the "back" growth produced by the cut branches and the better development of the shorter ones filling up and furnishing the tree in a season or two. All conifers, both indoors and out, are improved in this way.

School of Forestry.—There has been some talk of a school of forestry for England for some years, and now at last it is announced that something of the kind is to be started in the Royal Botanic Garden at Edinburgh. The prospectus states that the scheme is intended to offer an opportunity to gardeners and foresters to study the sciences underlying the practice, as well as the principles of horticulture and forestry. It is proposed to extend the course over two and a half years and to find employment in and around Edinburgh for men desirous of taking advantage of the scheme, so that while supporting themselves by the practice of their profession, they could continue the course of special study at the Botanic Garden at such times as shall not interfere with the usual hours of labor. There will be no charge for the course. Only practical gardeners

and foresters are to be allowed to share the advantages of this scheme. There has been something of the same kind in operation at Kew for a considerable period, but it is limited to the young men employed in the Royal Gardens. They are expected to go through courses of lectures on physics, chemistry, systematic botany, geography, etc. In the winter they form a mutual improvement society for the purpose of reading and discussing essays upon horticultural subjects.

Bouillie Bordelaise and Potato Disease.—Experiments, with a view to testing the value of Bordeaux mixture as a fungicide, have been made this year by Mr. H. F. Moore, for Messrs. Carter & Co., of High Holborn, and a report of the results furnished by them for publication. Last year similar experiments were made by Messrs. Sutton & Sons, Reading, with results which, on the whole, were unfavorable to the Bouillie Bordelaise as a cure for potato disease. The report of Mr. Moore, however, is exceptionally favorable. I quote the following from it:

The experiment was made on a field of a little less than an acre of potatoes, which were planted in ten long double rows on April 8th, the drills being thirty-six inches apart. The whole piece was divided into four equal parts, of which the first and third were dressed with the mixture, and the second and fourth left undressed. The strength of the mixture was as follows: 22 lbs. of sulphate of copper, 22 lbs. of unslaked lime, and 100 gallons of water, this being the quantity necessary for an acre of potatoes. For the purposes of the experiment the first and third quarters were dressed with the mixture on July 11th and August 2d, and the second and fourth left undressed. The mixture was applied by the Antipest, the new knapsack distributer, invented by Mr. G. F. Strawson, which did the work admirably. On the second occasion, a German machine was also tried, this also doing good work. The mixture was applied thoroughly on both surfaces of the leaf. The disease appeared early in September in the undressed portions, and on Thursday and Friday, September 15th and 16th, a party of leading agriculturists and horticulturists assembled to see the final results of a trial which has created considerable interest.

The following table gives the totals of the two duplicate experiments:

	Dressed plots. Cwt. qrs. lbs.	Undressed plots. Cwt. qrs. lbs.	In favor of dressed plots. Cwt. qrs. lbs.
Weight of sound tubers,	58 0 0	39 2 10	18 1 18
Weight of unsound tubers,	— — 11	6 3 11	6 3 0
Total yield,	58 0 11	46 2 4	11 2 7

It will thus be seen that in whatever aspect the experiment is looked at it is in favor of the dressing by the bouillie bordelaise. So far as sound tubers are concerned, the yield is about two tons per acre more than in the undressed portion (the two plots being less than half an acre), while the quality of the tubers is better.

The last meeting of the Royal Horticultural Society produced few plants of interest. A specimen in flower of Mr. Sturtevant's Aristolochia Gigas, grown in a six-inch pot, was the chief attraction. It was awarded a first-class certificate and the regret expressed that something better could not be done to mark the high opinion of the plant formed by the committee. Two varieties of Cattleya, one called C. Statteriana and the other C. aurea, var. Statteriana, both remarkable for the small amount of crimson on the labellums, were shown by Mr. Statter, and Messrs. Veitch showed a new hybrid Cattleya named Minucia, which they had raised from C. Loddigesii and C. labiata, var. Messrs. Linden, of Brussels, sent two Cyrtopodiums, one named C. macranthum, having yellow flowers very similar to those of C. cardiochilum, the other named C. Aliceæ, with white flowers spotted with dull red. Pteris nivalis, a seedling form of P. Victoriæ with broader pinnæ than the latter, received a certificate. Two large-podded Runner Beans, named respectively Hill's Prize and Prize Winner, were awarded first-class certificates, as also were four Kidney Potatoes, namely, Reading Giant, Mary Anderson, Quantity and Quality and the Canon. We have too many kinds of Potato. I grow two, which cannot be beaten here, Early Rose and Magnum Bonum.

London. *W. Watson.*

Fig. 82.—Live Oak (Quercus Virginiana) in St. Augustine, Florida.—See page 483.

Cultural Department.

Tomatoes as a Summer Greenhouse Crop.

VERY many garden crops are suitable to greenhouse cultivation, but the commercial grower is limited to those which will pay, and the decision of this question depends very largely on locality. In our large cities Cucumbers, Tomatoes, Cauliflower, and even other vegetables, can be grown with profit, but the kind of crops and their succession must depend on various circumstances. A recent bulletin of the Ohio Experiment Station, which is situated at Columbus, explains why they find it necessary to adopt a course which is quite different from that followed in other cities. The Lettuces which are most profitable there are Simpson's and Grand Rapids, both belonging to the non-heading class.

Two crops of Lettuce are taken from the beds, and the houses are then occupied by Tomatoes late in the season, when Lettuce cannot be grown profitably. The Tomatoes, if forced in winter in large quantities, cannot be sold to advantage, but in late spring and early summer they will bring prices almost equal to those which rule in midwinter, and the houses are occupied when they would yield nothing more valuable. It may be added here that Cucumbers can be grown in the place of Tomatoes, but they are less profitable. The quick-growing Turnip-rooted Radishes are fairly remunerative, and the same is true of Beans. Cauliflower would not pay at the prices which can be obtained, but Asparagus, Pie-plant and Dandelions, although they do not command large money returns, can still be grown to advantage, because they utilize the space under the benches. Mushrooms, too, can be grown under the benches where there are no pipes, and this is a profitable crop.

This cultivation of Tomatoes in the greenhouse for spring and summer is not altogether novel, but it is not very widely practiced, and therefore we condense from the bulletin alluded to the report of Mr. E. C. Green, the assistant horticulturist of the station, which details the methods of cultivation. It seems probable that the system could be adopted in other places near medium-sized city markets with profit. The house which is used for Tomatoes is occupied in the winter by other plants, while the Tomato-plants are kept in as small a space as possible. As a rule, vegetable houses are empty about the middle of May, when the last crops of radishes and lettuce are taken off, and after this time they can be used with a nominal cost for fuel, and no extra expense for filling benches with soil, so that altogether they make a rather inexpensive crop.

It has been the experience of Mr. Green that these house-grown Tomatoes have been in constant demand. In the midst of the strawberry and raspberry season tomatoes sold at fifteen or twenty cents a quart, which is twice the price of berries. When tomatoes began to come from the south it did not

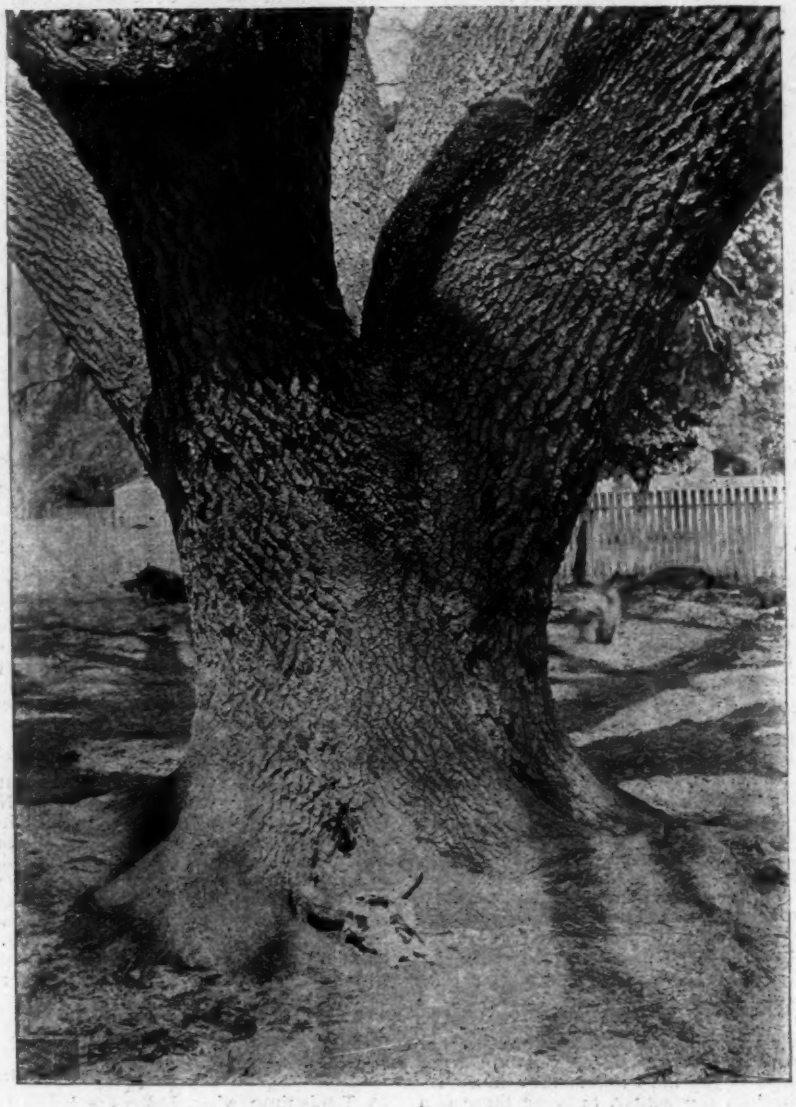

Fig. 83.—Live Oak (Quercus Virginiana) in St. Augustine, Florida.—See page 483.

interfere with the sale of the tomatoes from the greenhouse, because they were of such superior quality. The seeds of Tomatoes should be sown about the middle of December if the plants are to be ready to set in beds by the middle of March, or as soon as the crop of lettuce is out. The seeds should not be sown earlier than this, or the plants will become too large or injured by crowding. The plants need warmth and sunlight, and should be kept in a warm part of the greenhouse and never allowed to be chilled. Although they will thrive with less water than many other plants, the soil should not be allowed to get dry, while excessive watering should always be avoided.

After the plants are furnished with their second or third leaves they should be transplanted at least once more before they are large enough to be placed where they are to fruit. At the first transplanting they should be set two inches apart each way and twice as far at the second transplanting. When they are set where they are to stand finally they are planted directly in the soil, eighteen or twenty inches apart each way. Large pots and boxes, which are recommended for forcing winter plants, have been tried for these spring and summer fruiting Tomatoes, but they seem to have no advantage. The last transplanting should be done some time in March, for after the middle of this month the benches cannot be used for Lettuce profitably as the houses are liable to get too warm, and the abundance of Lettuce from hot-beds brings the price down. But when the Tomato-plants are set out, if good Lettuce-plants are set between them a fair crop of the latter may be grown before the Tomato-plants reach any considerable size. After the Lettuce is off, the Tomatoes should have the entire ground and should have a good mulch of fine manure, which will assist in holding water that is applied to the bed. The plants should be trained to one or two stakes, and a wire or string is a preferable support to stakes. The top may be made fast to the rafters and the bottom anchored by sharp wooden pins driven into the bottom of the benches or by wires stretched across near the surface of the ground. They must be tied to these upright strings or wires frequently as they grow.

Pruning is important not only because it increases the size and earliness of the fruit, but in order to get the largest yield possible in the smallest space and to keep the plants in the best shape. It is not the nature of the Tomato-plant to confine itself to one stalk, and when compelled to do so its efforts to grow side branches are persistent. Not only will sprouts come out of the axil of each leaf, but the ends of the blossom-stalks will develop into branches, and even the upper surface of the main vein of the leaves will send out sprouts. All of these must be taken off or there will be a tangled mass of vines if the plants are close together. The varieties which do well out-of-doors are the ones which will do well in the house for spring and summer. The best purple kinds that have been tested are Acme and Beauty. The best red kinds are Perfection and Paragon. The Lorillard, which is recommended so highly for winter-forcing, has not done so well under this system as some others. The early rough varieties are not desirable since pruning seems to make them more irregular. After a thorough trial the Atlantic Prize, one of the best of this class, has been discarded, and so have Hundred Day and King of the Earliest. The Dwarf Champion has some good qualities since the plants can be set closer together and nearer to the glass than other varieties. The first fruits that set are of fair size, while on some of the other varieties they are small. It is difficult to prune, however, because the heavy leaves hide the sprouts and it does not yield heavily.

Garden Annuals.

ANNUALS are more generally a part of the flower-border now than ever before in small gardens as well as in larger ones. This class of plants is popular because they do not require to be cared for through the winter, because there is a larger variety to choose from than formerly; and in most cases, also, with seeds sown where they are to flower, success is almost sure. Where a greenhouse, or even a hot-bed, is at command, a fine display may be produced with very little outlay. Home-grown seeds, carefully selected, may be planted with success, but seeds of first quality can be bought at low prices, so that there is no advantage in saving seed except in the case of some special varieties it may be desirable to perpetuate.

Among annuals recently introduced are the Marguerite Carnations, a most useful race of plants that give good double sweet-scented flowers the same season they are sown. There seems to have been too great demand for these seeds, and the producers have not given themselves time to weed out the single-flowered kinds. This year more than half the plants have produced single flowers, a much larger percentage than when this strain of Carnations first became known. Our season here is too short for them unless they are raised early under glass and hardened off previous to planting out early in summer. I find it best to sow them in January, when they will flower soon after midsummer, and last until frost.

Coreopsis Drummondi is an annual species of great service for a continued display. The flowers are of good size, though not so large as those of C. grandiflora, but they are much more numerous, and may be cut for several months. This Coreopsis is also useful for winter-blooming; if sown early, and transplanted into seven or eight inch pots, it gives good returns all through the early spring months. The same applies to the yellow Corn-flower (Centaurea suaveolens), also desirable for cutting. Pot-culture suits both these plants best; in benches they are apt to grow too vigorous toward spring and to wilt during sunshine. Coreopsis Drummondi and Centaurea suaveolens may both be sown in the open gronnd at the usual season for a display in summer and late in autumn.

An annual climbing plant which has given us much satisfaction is Dolichos Lablab, the Hyacinth Bean. The panicles of flowers are very showy, both the purple and white varieties, but the clusters of seed-pots are a lasting ornament, as they turn a rich dark purple and keep this color until killed by frost. We sow the seeds where the plants are to remain during the summer; they grow rapidly and flower and fruit freely in a sunny position. In our section Cosmos hybridus does not flower in the open air as in more favored states, but is grown in pots and taken into the greenhouse in the fall, where it yields a harvest of beautiful long-stemmed flowers in the dull autumn months, when they are most acceptable. Cosmos is best sown in May; it flowers as soon and is not so tall as if sown earlier, and the results are as good; these plants are strong growers and require an abundance of food and moisture. Under pot-culture it is necessary to give these requirements several times a week. If this care is not possible they may be planted out in summer, lifted in the fall and planted in large pots.

Solanum ciliatum is a beautiful berried plant for winter decoration. When well grown the plants are as ornamental as a small Orange-tree laden with fruit, and much easier to obtain. Seeds are now offered in trade lists and should be sown early under glass and grown in pots during the summer. Our plants are in eight-inch pots and average about thirty fruits to a plant. These are a bright orange-scarlet, from one to two inches in diameter and grow along the under side of the branches. The shoots are pinched once or twice during the growing season to bring them into shape. The plants are now available for decorative purposes and may be used all winter, as the fruit is very persistent even after the foliage has fallen. It should be added that the specific name of this plant refers to an abundance of sharp spines on both sides of the leaves and on the branches.

For a bold ornamental foliaged plant for outdoor planting in summer, the new Tobacco plant, Nicotiana colossea, of seed catalogues, is much the best of its kind. The correct name is N. tomentosa. It is a colossal species that requires liberal treatment to do it justice. Our plants were raised late, and for this reason have not flowered this season, although they have grown about six feet high and show well in a large border. As an isolated plant N. tomentosa would be found useful, but it is too large for most borders. This giant Tobacco plant should be sown early under glass and planted out when a good size. It will then probably flower here as it has at Kew and elsewhere in Europe.

South Lancaster, Mass. *E. O. Orpet.*

The Chionodoxas.

AT this time, when bulbs are being bought, attention may be called to the Chionodoxas as among the most attractive plants flowering early in the year. They should be grown in clumps and masses in the front border, where they succeed the Snowdrops. The bulbs are small and perfectly hardy, and increase rapidly, so that it is difficult to clear the ground from them when they are once established, as the small tubers are not easily found without sifting the soil. The Chionodoxas are not rampant growers, however, and do not endanger other plants. They are low-growing plants with narrow leaves; a radical-curved scape bears from three to ten flowers, which are usually erect.

Chionodoxa Cretensis is an old introduction. The flowers of this species are small, and in neither of its two varieties, blue and white, attractive in color. It is not often grown in gar-

dens, being neither effective nor interesting except in a collection. The popularity of Chionodoxas dates from the introduction of C. Luciliæ from Asia Minor. This species has all the points of a good garden-flower, and is one of the brightest gems of the spring-time. The flowers from collected bulbs vary considerably, but good forms have flowers over an inch in diameter, with light blue tips and white centres. This species, which is also known as C. Forbesii, produces flowers more freely than the other kinds.

Mr. Edward Whittall, of Smyrna, during his hunting expeditions discovered that there were on the Taurus Mountains many bulbous plants unknown to cultivation, and, with an Englishman's natural fondness for flowers, organized a systematic search of the hills for bulbs which were likely to prove attractive in gardens. This work is carried on by the natives under direction. The country is in a shocking state of anarchy, even within sight of Smyrna, and the work is done at considerable risk. To Mr. Whittall we owe the following varieties, which have been introduced by his efforts: C. Sardensis, a dark blue-flowered kind, which has met with appreciation, the color being the blue of the interior of the cup of Scilla Siberica. As the Scilla-flowers are duller on the outer cup, C. Sardensis, with its upright flowers, is superior in its intensity of blue as seen in the borders. C. Tmolusi is a species collected on a height of this name, but appears to be a local variety of the Luciliæ type, having a large white eye such as is often found in the type.

Chionodoxa grandiflora, or gigantea, was next found, and is a variety of much beauty, though it has met with slow appreciation. It has a flower somewhat larger and with broader petals than C. Luciliæ, and the color is an opaque blue. The eye is very small and white. In my border the plants have shown only two or three flowers on each scape. The figure of this Chionodoxa, in a recent number of *The Garden*, is not satisfactory; the color is too deep, and linings are shown which do not appear in the flowers. Among bulbs of C. Luciliæ some are occasionally found which give pure white, or rose-colored, flowers. The former are especially pure in color, and are very charming. Unfortunately, these are among the rarest of bulbs, and are not in the dealer's stock. This season Mr. Whittall has sent out a new species, C. Alleni, which he says is the finest yet found. As it comes without description, we trust it to the border with pleasant anticipations of a new charm to enjoy as the lengthening days of another spring bid it welcome to a new home.

Elizabeth, N. J. *J. N. Gerard.*

Seasonable Notes.

CHRYSANTHEMUMS will naturally have a prominent place in the garden-world during the weeks to follow, and there will be many magnificent blooms at the exhibitions throughout the country; but the amateur cultivator must not look for similar flowers on the same varieties in his own collection, unless his specimens receive the same attention.

To secure the immense flowers seen at exhibitions the strength of the plant has been thrown into one or two blooms by a careful system of disbudding and feeding, and the foliage kept clean and free from insects. Unless the flowers are intended for exhibition, greater satisfaction will be had from more naturally grown plants, especially for conservatory and house decoration, and a large mass of reasonably good flowers will prove more effective than a few spindling specimens crowned with a single blossom that some one has sarcastically described as resembling "a variegated mop." Some disbudding should be practiced, however, as there is usually a superabundance of buds on most varieties, and tying and training should also receive some attention, without disfiguring the plants with a forest of stakes.

Where the conveniences are at hand, the vaporizing of tobacco extract is the most cleanly and effective method of removing aphides from Chrysanthemums. If this cannot be done, fumigating with tobacco-stems must be resorted to, either method being used at frequent intervals before the buds begin to open, in order to keep the plants thoroughly clean. Feeding with manure-water should also be persisted in, but with pot-plants care must be taken to keep the drainage open or the plants will soon suffer.

Among the earliest varieties I have noticed this season are Eldorado (Waterer), an excellent yellow of sturdy growth and fine foliage, and Ivory (Harris), a particularly good white either as a pot-plant or for cutting, being of medium size and excellent habit. Outdoor Chrysanthemums may be preserved from frost long enough to allow the full enjoyment of their flowers by covering them at night with water-proof muslin stretched over a light frame-work of wood. The muslin may be procured from almost any seedsman for from six to ten cents per yard, according to the grade used. The present season has been a somewhat trying one for many outdoor operations. The lifting of stock from the open ground, as Violets, Carnations and Bouvardias, has been attended with some difficulty owing to the dry weather, but, as already noted in Garden and Forest, the success of this operation largely depends on the care with which the plants are treated after they are brought indoors.

It is desirable to grow a few Fig-seedlings (Ficus carica), in readiness for bedding out next season. In a mixed bed of foliage-plants these have a pleasing effect, the foliage of the Figs being both large and handsome, and seldom attacked by insects to any great extent. The experience of the past summer tends to confirm the value of Crotons and Acalyphas as bedding-plants, at least in this latitude; but it should also be remembered that while the Crotons will flourish in a greenhouse temperature of seventy-five to eighty degrees, it is not well to take the plants so grown directly from so warm a house and plant them out. When properly hardened off they are, however, among the most effective foliage-plants for outdoor decoration.

The Crozy Cannas continue to add to their fame with each succeeding season, and among the newer varieties Alphonse Bouvier, a green-foliaged variety, with large bright crimson flowers, takes a prominent place. Paul Marquant, also, is a fine variety, with some resemblance to Antoine Crozy, the flowers frequently over four inches in diameter. Capitaine Suzzoni is perhaps the best of the spotted type; the ground-color is yellow, over which is spread a profusion of red spots.

Holmesburg, Pa. *W. H. Taplin.*

Correspondence.

Fruits of Eastern Asia.

To the Editor of Garden and Forest:

Sir,—I have read, with great interest and pleasure, the notice on p. 438, with an illustration of a Chinese Peach grown from seed at the Arnold Arboretum. I was also pleased to note Professor Sargent's remark, "that the Peach is now believed to be a native of China." The result of this experiment, so far as it shows a superior hardiness in this Chinese seedling Peach, is an argument that in transferring the fruits of the old world to America there must be taken into account the difference in climatic peculiarities between the eastern and western sides of these two continents. I believe that the more this subject is studied the more reason we shall find for seeking a renewal of our tree-fruits for eastern America from among those of eastern Asia. Professor Budd, of the Iowa Agricultural College, has been experimenting in this line, and the Shense Apricot, which originated from a seed sent to Professor Budd from a missionary station in northern China, has proved to have remarkable vigor and hardiness, and is being now quite extensively planted. I hope the resources of the Arboretum may be more extensively availed of to import the Chinese and Manchurian tree-fruits as well as other plants from that region.

I notice also Professor Bailey's article on scab-proof Apples, on p. 442. There is a certain amount of reason, undoubtedly, in the apprehension that new and apparently scab-proof fruits will not retain that characteristic long. That has been the case certainly with many of the seedlings which have originated in our northern states. They do well for a while, but in time fall a prey to disease. But it should be borne in mind that these seedlings are all from the old stock of west European varieties, and although such seedlings show some accommodations—some approach to what we call acclimation—and although nearly all our profitable Apples are of this class, yet there is a latent weakness in them all. It will not take many generations to advance the work to a point which we may reach much sooner if we extend our researches among the orchards of north-eastern Asia.

All this will, of course, take time, and the older among us can hardly expect to reap any personal advantage from these efforts to introduce a better race of tree-fruits into our country. It is very evident that all the tree-fruits of western Europe find themselves quite at home in western America. It seems at least equally probable that the tree-fruits of eastern Asia will find a congenial habitat in eastern America, and these are considerations that especially urge growers who find themselves located in the most unfavorable localities, where our old stock of tree-fruits are complete failures, now to pioneer the work of research. In the cold north and in that region of extremes,

the Mississippi Valley, the evils referred to are the more instantly pressing; but it is quite plain, from what Professor Bailey tells us, that in our most favorable localities on the eastern slope, where at first the finest fruit was grown without even ordinary care, it is now impossible to grow it regularly in marketable quality without resorting to the constant use of fungicide as well as insecticide spraying.

I certainly do not desire to take upon myself the rôle of opposition to the use of either fungicide or insecticide spraying. I am using both in my own gardens and orchards; but the use of them, and the necessity for that use, only make me the more anxious to obtain and test any and all varieties of fruit-trees and plants, adapted to our locality, which show exceptional resisting power against any and all the ills to which orchards and gardens are heir. Having attained this, the heavier portion of the task is completed, and we have only to concern ourselves with the details of the work. But so long as we have to contend with fundamentally unsound material our task becomes so difficult as to greatly discourage its prosecution.

Newport, Vt. *T. H. Hoskins.*

The Apple-scab Again.

To the Editor of Garden and Forest:

Sir,—I have recently made a trip through southern Michigan, where the apple-crop is probably the smallest ever known. Everywhere the trees present a sorry appearance. The foliage is small and curled and brown, and even at a distance of half a mile the orchards appear to have been scorched with fire. Many trees are so badly affected that they have hardly cast a shade all summer. In some orchards I notice green tips on the branches, marking the renewed vigor produced by the late rains. Everywhere the apple-growers are discouraged, and they are wondering if the trees can survive such injuries. These are the same troubles as those which overran western New York in 1890, and which caused such widespread alarm. But in 1891 the New York orchards gave a fair crop of fine apples, and here is some consolation for the Michigan people. But the injury must seriously shock the trees, and, aside from the loss of this year's crop, the mischief must be considerable.

All this serious leaf-trouble is to be laid to fungi, which were enabled to develop with fatal rapidity in the wetness of last spring. It is probable that these fungi even caused much of the dropping of the little fruits themselves. It is evident that most of the dropping of the flowers is wholly natural, and to be expected, for, as a rule, only one fruit sets in a cluster of flowers. In most tree-fruits the fruitage is necessarily much smaller than the full bloom. Later on the drought came, and the injury added to the troubles from the rains and the fungi was complete. The orchards in the older part of Michigan now present a sad appearance. In northern Michigan, in the Traverse region, the apples are unusually good this year, and I am told that the rains did not begin there until after the fruits were well set.

The chief fungus concerned in this scourge appears to be the fusicladium, or scab-fungus, which causes the familiar black scab-like spots on the fruit, as well as a blight or mildew of the foliage. The scab-fungus injury upon the leaves usually appears as grayish or gray-brown blotches, appearing to rest upon the surface, and not completely killing the tissue beneath it. But there is another injury of the leaves characterized by a complete dying of the tissue, so that the leaves become winter-brown in patches or along the edges. This injury is possibly due to a Phyllostieta. Professor Beach, of the New York State Experiment Station, tells me that still a third fungus appears to be concerned in this Apple-leaf blighting. The occurrence of two or more fungi in these scourges has been mentioned several times by recent writers, but the exact part which each plays in the destruction of fruit and foliage has not been determined. It seems to be generally agreed that the scab-fungus is the most mischievous.

In connection with the discussions now running in Garden and Forest concerning the relation of certain varieties of Apples to the scab, it may be worth while to make a record of the behavior of the blight in my father's orchard in south-western Michigan. Some of the varieties here recorded are represented by a single tree in the orchard, but the most important varieties are in good number, especially Rhode Island Greening, Baldwin, Stark, Northern Spy, Esopus, Spitzenburg, Golden Russet, Talman Sweet and Swaar. I have thrown the varieties into three categories as well as I can: 1. Those very badly injured, which for weeks have hardly cast a shade, and in which none of the leaves have reached normal size, the trees presenting no green color. 2. Those much injured, in which some of the leaves reach normal size and the trees present a somewhat green appearance, but none of the leaves are free from conspicuous injury. 3. Those little injured, in which all the leaves attain normal size and the tree looks full, but all the leaves are marked by scab. I found no varieties which I could put into a fourth class, to be characterized by no injury whatever. It remains to be said that all varieties without distinction, save, possibly, a few trees of Flower of Genesee, failed entirely to produce fruit, although they all blossomed full.

1. Varieties very badly injured: Baldwin, Belmont, Bunker Hill, Chenango, Early Harvest, Esopus Spitzenburg, Golden Russet, Grimes' Golden, Jonathan, Newtown Pippin, Nickajack, Northern Spy, Rambo, Rhode Island Greening, Paw Paw, Siberian Crab, Stark, Summer Queen, Surprise, Swaar, Tompkins King, Westfield, Seek-no-further, Williams, Yellow Bellefleur.

2. Varieties much injured: Beehouse, Fall Jenneting, Fall Pippin, Holland Pippin, Stark, Stode's Birmingham, Swaar, Talman Sweet, Transcendent Crab.

3. Varieties little injured: Baldwin, Cabashea, Cloth of Gold, Cogswell, Egg-top, Flower of Genesee, Northern Spy, Red Astrachan, Red Canada, Rhode Island Greening, Roxbury Russet, Sweet Bough, Transcendent Crab, Twenty Ounce.

It will be observed that some varieties occur in two lists. The Baldwin, Northern Spy and Rhode Island Greening, for instance, occur in the worst and best lists, yet the trees, so far as could be seen, were equally exposed to untoward circumstances. Some Baldwins were almost defoliated, and none of the leaves had reached more than half-size, while others in the same orchard might have been passed by the casual observer for trees in perfect health. Some young and vigorous Baldwin-grafts were scarcely injured. The blight appears to affect the various varieties differently. The foliage of Beehouse and Sweet Bough, for instance, presents a thick and conspicuously curled appearance, much like the leaves of Snowballs which are attacked by aphides.

At the recent meeting of the American Horticultural Society in Chicago several persons spoke of the comparative immunity from scab of some of the hardier Russian Apples, and it seemed to be a prevailing opinion that a more or less immune race of Apples can be bred from them. I hope that this prophecy may come to pass. It is an interesting field, but I cannot rest my faith entirely upon it for ultimate and permanent results. It is certainly expedient to extend the operation of spraying at the same time that we are striving for resistant varieties. In years like the present, the best efforts are likely to give indifferent results, but I believe that spraying every year will lessen the evils of the bad years.

Cornell University. *L. H. Bailey.*

Legislation against Injurious Insects.

To the Editor of Garden and Forest:

Sir,—The editorial on "Legislation against Injurious Insects and Plant Diseases," in your issue of September 28th, is both important and timely, and merits the careful consideration of every association of agriculturists in all parts of the Union. In New Jersey there is already a very strong feeling among the farmers who are following experiment station advice, that something should be done to protect them from the neglect of their less progressive neighbors, and the subject will be agitated in the county boards and probably also in some of the state societies during the coming winter.

Allow me to give two examples of the necessity of some action. The pear-midge (Diplosis pyrivora) has been, quite recently, introduced into New Jersey, and is slowly spreading. It reached New Brunswick in 1891 and settled in a neglected orchard not far from town. The owner of this orchard has other business and simply allows it to take care of itself. The trees are old, diseased, infested by insects and, except in rare cases, produce no marketable fruit. Closely adjoining is a Pear-orchard, whose owner uses all means to get fine, perfect fruit. The trees are healthy, are kept free from disease and insects by the intelligent use of the fungicides and insecticides, and bear heavy crops of the finest varieties of pears—fruit that takes premiums annually wherever exhibited. In the spring of 1892, a few midges found their way to this orchard and a few Pears were infested. Vigorous means were at once adopted to destroy them; but what is the advantage? In the neglected orchard close by, at least fifty per cent. of the fruit was infested early in the season, and thousands of midges will mature there next spring and will not all remain in the old orchard. Despite all preventive measures, the good orchard will suffer and the owner will lose a considerable sum, simply because his neighbor will not care for his own property.

In Atlantic and Cumberland counties, large tracts are de-

voted to Blackberry culture, and much fruit of fine flavor and good size is shipped to northern, eastern and western markets, as well as to New York and Philadelphia. The most serious enemy to Blackberry culture is the red-necked cane-borer (Agrilus ruficollis), which is yet very easily controlled by cutting out the galls when pruning in spring, and burning the cuttings. But of what avail is it to the intelligent grower if he cuts out all the galls in his field carefully, if his neighbor allows those in his field to stand? For several years last past this insect has steadily increased in number, and a tax of fifty per cent. on the crop of the two counties is a low estimate of the injury caused in 1892. On many acres the crop was not considered worth picking, and the fields were allowed to take care of themselves. They have done that so well that early in September I found many of them in which every new cane was galled, and in some canes as many as ten and even twelve galls were on a single cane. The host of insects that will develop there next spring will not find canes for one-tenth the females that will desire to oviposit, and they will fly to the neighboring well-kept fields, and will levy their tax on the innocent and careful grower as well as on the guilty careless one. There are hundreds of acres scattered in these two counties which will, next year, produce more insects than Blackberries, and which, for the benefit of others, should be utterly destroyed this winter.

It is a maxim of the common law, that every man must so use his own property as not to injure his neighbor or others; but it is a matter of very grave doubt whether any attempt at redress under this maxim would be successful under the present circumstances. Certain it is, that there is no justice in allowing one careless individual to impose a heavy tax on all his neighbors. A man who raised foxes and turned them loose in his neighbor's chicken-yards would be brought up with a round turn very suddenly. There is no reason that I can see why one who willfully breeds insects to infest his neighbors' orchards stands on a different footing.

I hope you have not said your last words on this subject.

Rutgers College, New Brunswick, N. J. *John B. Smith.*

Exhibitions.

Fruits and Vegetables at Boston.

THE fruit and vegetable show of the Massachusetts Horticultural Society, held at Horticultural Hall in Boston during the first week of this month, was, in point of exhibits, a noteworthy success. The somewhat slender attendance was a new proof of the lack of public interest in the efforts of specialists who have given so much study and time to improving the quality and beauty of table fruits and vegetables. It is to be regretted that the efforts of our best horticultural societies meet with so little appreciation.

The fruits at the recent exhibition occupied the entire upper floor of the building, and the vegetables were arranged in the spacious hall beneath. Apples were largely represented, and some idea of the extent of this display may be gleaned from the fact than no fewer than two hundred and seventy dishes, illustrating about thirty varieties, and averaging twelve specimens to a dish, were placed in competition. The contributions of pears were larger still. There were two hundred and ninety-five dishes, each containing twelve samples. Some twenty-eight varieties were shown in their finest form, so that the display was as beautiful as it was extensive.

Grapes, especially the native kinds, were plentiful and of good quality. The state Agricultural College at Amherst and Mr. Benjamin G. Smith, of Cambridge, were the principal exhibitors of domestic varieties, and these growers, with several others, supplied the total of 165 plates of six bunches each. The Amherst exhibit contained sixty-one distinct varieties, and it afforded grape-growers an opportunity for selection which comes too seldom. The first prizes for foreign grapes went to Mr. J. Monteith, gardener to Geo. A. Nickerson, of Dedham, and Mr. John Ash, gardener to Mrs. J. W. Clark, of Pomfret, Connecticut. The former was first in four classes, with Gros Moroc, Golden Hamburg, Black Hamburg, Alicante, Buckland Sweetwater and Muscat of Alexandria, and the latter in one class, with Black Alicante, in every respect the best grapes in the hall.

Mr. George S. Curtis, of Jamaica Plain, was an easy first in Quinces. Some splendid orchard-house examples of the Late Crawford Peach were shown by Mr. Robert McLeod, gardener to D. B. Fearing, Esq., Newport, Rhode Island; Mr. N. D. Harrington, of Somerville, secured first for the same variety grown out-of-doors, and a like honor was conferred on Mr. W. D. Hinds, of Townsend, for the Crosby. Plums were of indifferent quality, and prizes were given to Mrs. Mary Langmaid, of North Somerville, and Mr. E. S. Grant, of Concord. Mr. C. Terry, of North Weymouth, was the only exhibitor of Cranberries, and Pine-apples were contributed by Mr. Jackson Dawson, of the Arnold Arboretum. Some curiosities were furnished in the form of a branch of the Sheldon Pear, with a close cluster of seven fully developed fruits at the extremity, and in a dish of Endicott pears from a tree imported from England by Governor Endicott in 1636.

The vegetables, embracing all the best seasonable sorts, were numerous and of first-class appearance. The miscellaneous exhibits included a collection of hardy flowers from the Harvard Botanic Garden, some vases of creditable single and double Dahlias from C. E. Josselyn, of Framingham, four dishes of very fine flowers of tuberous-rooted Begonias from Francis Brown Hayes, Esq. (Mr. James Comley, gardener), of Lexington, and a nice group of Streptocarpus, from Mr. Wm. Martin, gardener to Nathaniel T. Kidder, Esq., of Milton. Mr. Kidder was successful in obtaining the first prize for a collection of flowers of forty herbaceous plants, the Shady Hill Nursery Company, of Cambridge, being second.

Recent Publications.

Dictionary of Botanical Terms. By A. A. Crozier. Henry Holt & Co.

The science of botany has developed on so many lines within the last twenty years that there has been necessity of creating a great many new terms, and it is also true that many of the old ones have been practically abandoned, and inasmuch as it has been almost a score of years since any English dictionary of botanical terms was published there is abundant demand for a book like this. The modern study of structural and physiological botany is responsible for many of the newer terms, but improved practice in agriculture and horticulture, as well as the advance in the sciences on which both these arts are based, has also made many new words necessary. This book of Mr. Crozier's seems to be very complete in both the practical and scientific sections and will be a welcome addition to many reference libraries.

Fruit-culture. By W. C. Strong. Rural Publishing Company.

This little hand-book was first published seven years ago, and was intended to furnish condensed and simple directions for the average owners of homesteads who wish to raise a few fruits for home use. So great, however, has been the advance in the practical methods of protecting crops from insects and fungi that a book seven years old is quite behind the times. Mr. Strong has, therefore, prepared a new edition, in which he has attempted in a concise way to embody the results of recent experience with various insecticides and fungicides, and the methods of applying them. Of course, in a brief two hundred pages, nothing like extended description of varieties of different fruits can be looked for. The book contains, however, in a very compact form, the best methods of cultivation for each separate fruit and some descriptions of the best varieties, with illustrated directions for propagating trees from the seed, by cuttings, by layers, by grafting, etc. The book is not intended to supersede the more exhaustive treatises which have been written for those who wish to grow fruit on a large scale, but for the inexperienced cultivator Mr. Strong's book will be welcome and helpful.

Notes.

The white form of Plumbago Capensis is comparatively rare, but it resembles the species in almost every respect except in the color of its flowers, and the two together are admirable companions.

Mr. John Westcott, who is well informed on such matters, is reported in the *Florists' Exchange* as saying that in the neighborhood of Philadelphia there are fifty houses full of Chrysanthemums in excess of the quantity produced last year.

A Douglas Fir was planted in the spring of 1842 at Walcot, the seat of the Earl of Powis, in Shropshire. This spring, after it had stood fifty years, it measured one hundred and seven feet to the top of the leader, and at four feet from the ground the girth of its trunk was twelve feet nine inches.

The planting of the dunes at Blankenberghe, near The Hague, in Holland, begun on a great scale three years ago, is being steadily carried on. So successful has been the work

that in some of the places first planted certain of the selected species have already attained a height of more than six feet.

The leaves of Spiræa prunifolia remain on the shrub very late in autumn, but they begin to turn among the first. They change very slowly from glossy green to deep crimson, and although the plant has a more whippy habit than most of the Spiræas, for October coloring, it is one of the very best of shrubs.

A Portugal Laurel at Combermere Abbey, in Cheshire, is said to be at least two hundred years old, and its branches have rooted in every direction. It has the appearance of being a large mass of shrubbery instead of a single Laurel. In places it is thirty feet high, and altogether it is a hundred feet in diameter.

The leaves of the Hickory are easily scorched by frost, and, therefore, in seasons when freezing weather comes early, the foliage turns brown and withers early. But in years like this, when frosts are delayed, the leaves ripen to a clear lemon-yellow, so that the Hickory becomes fairly luminous and is one of the most striking of our native trees, which are famous for their autumn colors.

A variety of Helenium autumnale, named Striatum, has lately received a first-class certificate in England, and it promises to be a welcome addition to our late-blooming hardy plants. It is particularly interesting because of its colors. The disk is spoken of as maroon and gold, and the florets are a rich red striped with yellow. Autumn gardens contain so many composites in which the prevailing color is yellow that this variation will be a pleasant relief.

As the Memorial Garden, which lies between Longfellow's Cambridge home and the Charles River, attracts so few visitors that it is believed its commemorative character is not generally recognized, it has been proposed to make this clearer by the erection of some sort of a monument to the poet. But, as the Longfellow family does not approve of this scheme, preferring the unmarked quiet open garden, it is probable that it will not be carried out.

Some years ago an oak-trunk was found buried at a depth of thirteen feet in a sand-pit at Musselburg, Germany. After examining the strata in which it had lain, Professor Geikie decided that it was a relic of the later stone age, and must be some 6,000 years old. Yet the great trunk, which was no less than five feet nine inches in diameter, was so perfectly preserved that it was worked into an elaborate chimney-piece, which now ornaments a house in Edinburgh.

A late bulletin of the Rhode Island Experiment Station gives a word of caution to the purchasers of wood ashes. Analysis of the ashes which is sold in that state shows that they vary widely in chemical composition and fertilizing value. In some instances they were of such a low grade that farmers were advised to demand of the dealer a guarantee. If farmers would always insist on such a guarantee and order samples sent to the state experiment station, the quality of the ashes sold would soon be improved and they would all contain such an amount of phosphoric acid and potash as would make them worth buying.

At present the use of birch-bark as a writing material is merely a diversion of the tourist, but in earlier years, as we know, the Indians put it to serious service, while in Europe the bark of the White Birch was an occasional writing material before the invention of paper. In India one of the most ancient of all writing materials was the bark of the Himalayan Birch (Betula Bhojpattra), allusions to it being found in books 2,000 years old. To-day this substance is employed as a lining for boots and shoes, but only charms and amulets are written on it, because of its great durability. The magic words are inscribed upon a small bit, which is then enclosed in a bead of gold or silver or brass, which is worn on the person.

Since Cypress lumber is being dried by artificial means, the product is much superior and the demand for it has largely increased. Several large Louisiana mills, we are now told by the *Northwestern Lumberman*, have been supplied with steam-heat kilns, in which there is no ventilation and an extraordinary dampness of the atmosphere. In this veritable sweat-box the sap and natural juices of the timber are actually steamed or boiled out of the fibre of the wood. The bottom of the kiln is of sand, into which the drippings from the wood drop and saturate it until it is converted almost into mud. After the heating process is continued for a certain length of time the kiln is opened, the air admitted, the moisture dissipated and the lumber turned out to dry.

The *Gardeners' Magazine* for September 24th contains an engraving of the comparatively new Polyantha Rose, named Turner's Crimson Rambler, which was brought from Japan a few years ago and received a gold medal at the International Horticultural Exhibition. The growth is very robust, and in July, when the truss was selected for figuring, thousands of plants which had been budded the previous summer had made shoots ranging from six to eight feet high. The trusses are produced in succession so that the display is maintained over a considerable period. The color of this Rose is described as a glowing crimson, and the truss figured contains a mass of more than fifty flowers fully opened, besides numerous buds all closely packed in a pyramidal mass.

So few formal gardens exist in this country that it is worth while to call attention to the picture of the one connected with the old convent school for girls at Georgetown, near Washington, which is published in the *Cosmopolitan Magazine* for October. This garden, which seems to have been laid out in the early years of the century, is, if one may judge from the picture, not a remarkable one in any way, yet it shows how attractive may be a combination of naturally developed trees, with systematically arranged paths, borders, grass-plots and flower-beds. And, as has often been said in these pages, such a combination might be made as beautiful and appropriate in small grounds attached to dignified buildings as are our customary attempts at landscape-gardening on a miniature scale.

A note in one of the daily papers announces the sale to a Baltimore syndicate of the Dismal Swamp Canal for the sum of $10,000. This famous canal connects the waters of the Elizabeth in Virginia and the Dismal Swamp with the Pasquotauk in North Carolina and is twenty-three miles long. Its construction was authorized by act of the Virginia Assembly in 1787, and George Washington was its original projector. It cost $1,500,000. The new owners propose to "improve the waterways and develop the timber-lands," which are very valuable and include tracts of Cypress and other trees of large size. With the exception of the main Jericho Canal and a few smaller passages and Lake Drummond, some ten miles in the interior, the swamp is practically impenetrable on account of the dense growth of Cane-brake.

The report of the Director of the Kansas Experiment Station contains an article on the contagious diseases of the chinch bug, which is pronounced by Professor H. T. Fernald, in *Agricultural Science*, one of the most valuable contributions to economic entomology which has lately appeared, ranking in importance with the introduction of the Vedalia into California. The experiments were begun in 1889, and healthy bugs placed in jars with diseased ones quickly became affected, and the field-trials showed that when a number of these diseased bugs were liberated where others were abundant the disease spread rapidly. In 1891 fourteen hundred field-trials were made, and more than three-fourths of these were so successful that the saving of the crops was estimated at more than $87,000, or $181 to each of the 482 farmers who tried the experiments. In the opinion of Professor Fernald this report marks the first apparently successful entrance of entomology into an almost unknown field, where much progress is to be hoped for. He believes that the cultivation of the natural enemies of our insect pests and the keeping of stocks of them on hand for shipment to infested areas is a line of work which must prove of great value. Any one who bestows a little thought on the relative advantages of insecticides applied by hand on the one side, and of parasites which are able to pursue their hosts from place to place and spread disease by infection on the other, will see that the latter is theoretically, at least, the most effectual and satisfactory.

Catalogues Received.

H. G. Faust & Co., S. W. cor. Front and Arch Streets; Philadelphia, Pa.; Wholesale Fall Catalogue.—Haage & Schmidt, Erfurt, Germany; Seed Novelties for 1893.—W. B. Hartland, Cork, Ireland; Daffodils and other Bulbs and Flower Roots.—Fred. W. Kelsey, 45 Broadway, New York; Choice Hardy Trees, Shrubs and Plants.—Harlan P. Kelsey, Linville, North Carolina; Native Plants of the Southern Alleghany Mountains.—Thomas Meehan & Sons, Germantown, Phila., Pa.; Trees, Shrubs, Vines and Evergreens.—John Saul, Washington, D. C.; Wholesale Catalogue of Fruit, Evergreen and Ornamental Trees, Shrubs, Roses and Greenhouse Plants.—Schlegel & Fottler, 26 South Market Street, Boston, Mass.; Fall Bulbs.—The Tottenham Nurseries, Ltd., Dedemsvaart, near Zwolle, Holland; Wholesale Trade-list of Conifers, Rhododendrons, Roses, Herbaceous Plants, etc.—J. C. Vaughan, New York and Chicago; Vaughan's Book for Florists, Wholesale Price-list of Seeds and Bulbs.